

We claim

1. A wireless communication apparatus for communicating with one or more base stations and one or more mobile stations comprising
  - a base station portion and a mobile station portion, said base station portion being adapted to communicate with one or more mobile stations and/or with one or more other mobile station portions; and
    - a mobile station portion adapted to communicate with one or more other base stations and or one or more other base station portions.
2. The apparatus according to claim 1 wherein control of mobile station functionality and base station functionality is provided by at least one control processor.
3. The apparatus according to claim 1 wherein said mobile station portion comprises at least one downlink receiver and at least one uplink transmitter
4. The apparatus according to claim 1 wherein said mobile station portion further comprises at least one baseband processor.
5. The apparatus according to claim 1 wherein said base station portion comprises at least one downlink transmitter and an uplink receiver.
6. The apparatus according to claim 1 wherein said base station portion further comprises at least one baseband processor.
7. The apparatus according to claim 1 wherein there is an interface between said base station and said mobile station portion and an interface

between a mobile station to said base station portion and said interfaces are decoupled.

8. The apparatus according to claim 7 wherein the mobile station portion and the base station portion have multiple physical channels.

9. The apparatus according to claim 8 wherein there are more receive channels present than transmit channels.

10. The apparatus according to claim 1 wherein a virtual mobile station is created when there is communication with a base station or base station portion.

11. The apparatus according to claim 1 wherein a virtual base station is created when there is communication with a mobile station or a mobile station portion.

12. The apparatus according to claim 1 wherein a proxy mobile station is created with a protocol entity that behaves as a mobile station.

13. The apparatus according to claim 1 wherein a proxy base station is created with a protocol entity that behaves as a base station.

14. The apparatus according to claim 1 wherein there are multiple instances of mobile stations and base stations that are used to provide connectivity among all relevant nodes in a network.

15. The apparatus according to claim 1 further comprising a command and control channel that is used to carry relevant information between other communication devices.

16. The apparatus according to claim 1 wherein the mobile station portion detects, quantifies and reports on the best available frequency channels within its vicinity.

17. The apparatus according to claim 16 wherein said detection, quantification and reporting by the mobile station portion is immediate.

18. The apparatus according to claim 16 wherein information is collected directly by measuring power and frequency from surrounding base stations, without utilizing communications channels.

19. The apparatus according to claim 1 wherein there is communication between the mobile station portion and the base station portion.

20. A system comprising one or more wireless communication devices for communicating with one or more base stations and one or more mobile stations said device comprising

a base station portion and a mobile station portion, said base station portion being adapted to communicate with one or more mobile stations and/or with one or more other mobile station portions; and

a mobile station portion adapted to communicate with one or more other base stations and or one or more other base station portions.

21. The system according to claim 20 wherein control of mobile station functionality and base station functionality in one or more of said devices is provided by a control processor.

22. The system according to claim 20 wherein one or more devices

have a mobile station portion comprising a downlink receiver and an uplink transmitter

23. The system according to claim 20 wherein said mobile station portion further comprises a baseband processor.

24. The system according to claim 20 wherein one or more of said devices have a base station portion comprising a downlink transmitter and an uplink receiver.

25. The system according to claim 20 wherein said base station portion further comprises a baseband processor.

26. The system according to claim 20 wherein there are multiple instances of mobile stations and base stations that are used to provide connectivity among all relevant nodes in a network.

27. A system according to claim 20 further comprising an operations and maintenance center that acts as a collector and arbitrator of frequency plans.

28. The system according to claim 20 wherein each device has an ability to monitor frequency utilization within its field of view.

29. A network comprising one or more wireless communication devices for communicating with one or more base stations and one or more mobile stations said device comprising

a base station portion and a mobile station portion, said base station portion being adapted to communicate with one or more mobile stations

and/or with one or more other mobile station portions; and

a mobile station portion adapted to communicate with one or more other base stations and or one or more other base station portions.

30. An apparatus according to claim 1 wherein said base station portion dynamically determines efficient routing paths based on prioritization, network loading and node availability.

31. An apparatus according to claim 1 wherein said mobile station portion allocates channels based on a survey conducted to detect and identify the best available downlink channel.

32. An apparatus according to claim 1 wherein latency of direct transfers is minimized by connecting an uplink receive path with an uplink transmit path and a downlink receive path with a downlink transmit path.

33. An apparatus according to claim 31 wherein channel selection is based on reported results from one or more base stations.

34. A method of wireless communication among one or more base stations and one or more mobile stations comprising:

communicating with an apparatus comprising a base station portion and a mobile station portion, said base station portion being adapted to communicate with one or more mobile stations and/or with one or more other mobile station portions; and

a mobile station portion adapted to communicate with one or more other base stations and or one or more other base station portions.

35. The apparatus according to claim 1 wherein said mobile station portion comprises at least one downlink transmitter and at least one downlink receiver

36. The apparatus according to claim 1 wherein said mobile station portion comprises at least one uplink transmitter and at least one uplink receiver.

37. The apparatus according to claim 1 wherein said base station portion comprises at least one downlink transmitter and at least one downlink receiver.

38. The apparatus according to claim 1 wherein said base station portion comprises at least one uplink transmitter and at least one uplink receiver.

39. The apparatus according to claim 1 being adapted to communicate with another apparatus of the same type.

40. The system according to claim 1 wherein one or more wireless communication devices for communicating with one or more base stations and one or more mobile stations said device are controlled by a single control processor.

41. The apparatus according to claim 1 being used to monitor existing base station activity.

42. The apparatus according to claim 1 wherein the base station portion of the apparatus can control activity of mobile stations.

43. The apparatus according to claim 1 wherein the frequency of the base station portion and the frequency of the mobile station portion are

decoupled.

44. The apparatus according to claim 1 wherein the modulation of the base station portion and the modulation of the mobile station portion are decoupled.

45. The apparatus according to claim 1 wherein the amplitude of the base station portion and the amplitude of the mobile station portion are decoupled.

46. The apparatus according to claim 1 wherein the data rate of the base station portion and the data rate of the mobile station portion are decoupled.

47. The apparatus according to claim 1 wherein the protocol of the base station portion and the protocol of the mobile station portion are decoupled.

48. The apparatus according to claim 1 wherein the action between the base station portion and the mobile station portion may be decoupled.

49. A method of communication among one or more base stations and one or more mobile stations comprising:

communicating with an apparatus comprising a base station portion and a mobile station portion, said base station portion being adapted to communicate with one or more mobile stations and/or with one or more other mobile station portions; and

a mobile station portion adapted to communicate with one or more other base stations and/or one or more other base station portions.